



Out of School Time

Frontline Staff Leadership Training

MATH GAMES AND ACTIVITIES

Practice – Make – Exchange

PROBLEM-SOLVING

Most worksheets you find can be extended far beyond appearances. Students do the practice with the worksheet and then can make their own version to exchange with a partner. Making their own version is a creative endeavor that requires higher level thinking; this is where the challenge and real problem-solving/learning are. Puzzles (decode the message, crosswords) and mazes are especially fun for these make-your-own challenges.

A number of worksheets in your packet work great for this like, **finding/counting shapes** and **number crosswords** (template on back of crossword). In your packet you'll find **Botley's Jumble** (which can be used for all operations or larger numbers) and a **Quadra's puzzle** (again, can be scaled up or down for the difficulty your students require). All of these can be a starting place to a make-your-own challenge.

Here's a problem-solving group game called "Guess the Number":

You take two numbers and figure out what their sum, difference, quotient and product will be. For example: If your numbers are 8 and 2, you will tell your group that your numbers make a sum of 10, a difference of 6, a quotient of 4, and a product of 16. This is a great game for working in math vocabulary.

LOGIC, REASONING AND PATTERNS

Skip Count Warm-Up

Toss a ball from person to person. Each time the ball is passed the person who catches it must call out the next number in the sequence. Count by 2s for younger kids, 9s for a challenge for 5th graders. Incorporates multiplication, movement and patterns.

Concrete Objects

When kids learn a new abstract concept, having something real and concrete to touch and move helps students to understand the conceptual process they're learning on a deeper level.

Beans are a great math object to use for adding, subtracting, multiplying, division, fractions, graphing and positive and negative numbers.

Connect the Dots

This is a partner game where students take turns drawing in lines in an effort to finish boxes that score them points. It can be paired with math facts to get more practice: if you get your math fact right (e.g. 6×3) you get to put in your line. If you miss it, you miss your turn and your partner has the advantage. (See "**Don't Duck Division**" for template for younger kids)

Don't Let Them Touch

This is a logic game where students have to try to color the puzzle using only 4 colors without letting any of them touch. Can students put their own shapes together to make a similar puzzle/challenge?

Make a Puzzle

Students have to do math to get all the answers lined up. In your binder you'll find the template for this make-and-take, which can easily be adjusted to whatever level of math your students are at.

NUMBER AND SHAPE SENSE

Number sense emphasizes that there is more than one way to get to a correct answer; it's about being able to think critically about numbers and have flexibility and creativity in your thinking. For example: If I ask you what 6×7 is, you don't necessarily need to have it memorized. You could remember that 3×7 is 21 and since 3 is half of 6 you can just double 21 to get the answer, 42. Or could use addition to get to the answer by skip counting by 6s or 7s. The important thing is you understand what multiplication really is and can use it flexibly and fluently.

One way to work on this skill is breaking apart complex shapes or making use of angles or shapes in novel ways (Example: "Draw a picture of a house with exactly 24 right angles, 6 acute angles, and 2 obtuse angles."). "Dodecahedron Decimals" is another great activity for figuring out place values.

See your packet for the "Bag of Beans" activity for 4th/5th grade; it can be adapted for higher skill level.

"Give Me" is a number sense game that's easy to play with no materials:

This is a game where students find lots of different ways to get the same answer. It can be played competitively, for individual journaling or for a group warm-up. It can be made hard or easy, and can also be tailored to whatever operations/concepts your students need to work on.

Here are some "Give Me" examples:

Give me two numbers that add up to...

Give me two numbers that equal ____ when they're subtracted.

Give me three numbers using addition and multiplication to make a number sentence that equals...

Give me five numbers using each operation that equal...

Give me 15 ways to make a dollar using only change.

WRITE

Have students write story problems for each other to solve. Students are usually up to the task when they know their peers will get to respond to their work. Make it goofy and fun by incorporating the names of people in the group into a problem, or spelling words for that week. Having students make their problems more story-like with extra information is good too, since learning how to filter out irrelevant information is an important skill.

Older kids could work on mileage, interest rates and budgeting, while younger kids should focus on problems that they can draw the solution to, like number of plants in a row/garden, feet on the playground, or pets on the block. *Remember:* having a picture and/or being able to explain how they got to their answer is the most important part.

Here's an example of a problem:

Your friend Martin's block is full of a variety of pets. His family has three dogs and 5 rabbits. Their next door neighbors have 3 hamster and they had two mice but they got away last week. The family one door down has a cat that had 7 kittens, but they had to give away all but one of the kittens because the kittens ate 25 of their 47 goldfish. The people in the house next to them have 8 chickens in their backyard. No one else on the block has pets.

Question for 2nd/3rd: How many pets are there on the block? How many were there last week?

Question for 6th/7th: If this pattern of pet ownership is generally true throughout the town and there are 92 blocks in the town. How many more chickens are in this town than hamsters?

Look in your packet at "Trip to the Aquarium" for another complex problem.

MEASURE

Math and science intersect here. This is an important skill that's also fun to do.

Measure the Room

Just like a write the room activity, students can measure the room. Little kids can decide if different objects make sense to measure in inches or feet and work on estimating before they measure (see "Round Off" for a K-2nd activity that includes a ruler students can cut out).

Scaling

Older kids can also work on their skills of estimation but can do harder tasks like scaling the room down (i.e. how long is a 12ft. wall if every foot equals $\frac{1}{2}$ an inch?) They can practice in scaling anything up or down, themselves a favorite toy (see directions for "Building Scale Models" in packet).

Graphing

Have students graph their heart beat. Students take their pulse every 30 seconds for 5 seconds. They transition from sitting to doing something, running, jumping, stairs, sit-ups, walking and record how their heart rate changes. When they finish they graph it to see how much spiked and if it steadily went down when they returned to resting. See "Grow Your Graph" for another activity.

Ratios and Fractions

Students make apple juice from concentrate to see how different ratios of water to juice concentrate taste. They make at least 3 different recipes, each calling for different amounts of the apple juice (at least one recipe will be very diluted and one will be very concentrated). They write what the ratios they tried were, how they should have tasted (one should have tasted twice as sweet as the other) and how they did taste. See your packet for another a couple other proportion activity: "How Many Sugar Packets" and "No Fear of Fractions".

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SUBJECT

Math

GROUPING

Individual

JUMPSTART MODULE

Battery Charger

BOTLEY'S MULTIPLICATION JUMBLE

DESCRIPTION Students practice multiplication by searching for multiplication facts on the activity sheet. The facts can be found across, backward, up, or down. (Multiplication by 1-5 is included.)

MATERIALS Botley's Multiplication Jumble activity sheet, graph paper, pencils

PREPARATION Make a copy of Botley's Multiplication Jumble activity sheet for each student.

PROCEDURE Distribute the activity sheet. Explain that students should search for multiplication facts across, backwards, up, and down (not diagonally). Point out the four multiplication facts that have been found already.

If desired, set a time limit and challenge students to find as many facts as they can before the time runs out. For further reinforcement, have students list their facts at the bottom of the page.

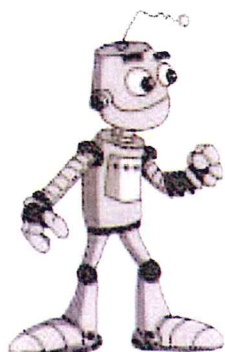
EXTENSION Encourage students to use graph paper to create their own Multiplication Jumble games to share with their classmates.

3	3	9	2	2	1	12	5	4	5
2	4	5	20	2	7	6	1	6	6
7	11	45	1	4	4	2	13	24	30
14	1	8	8	9	9	1	5	8	40
16	8	2	10	5	2	3	2	17	3
12	3	4	1	1	1	3	4	1	7
4	19	3	5	15	24	3	8	7	21
9	25	9	5	23	16	4	4	7	28
36	5	27	31	2	3	6	5	7	35
37	5	3	6	18	9	2	4	8	32

Answer Key

BOTLEY'S MULTIPLICATION JUMBLE

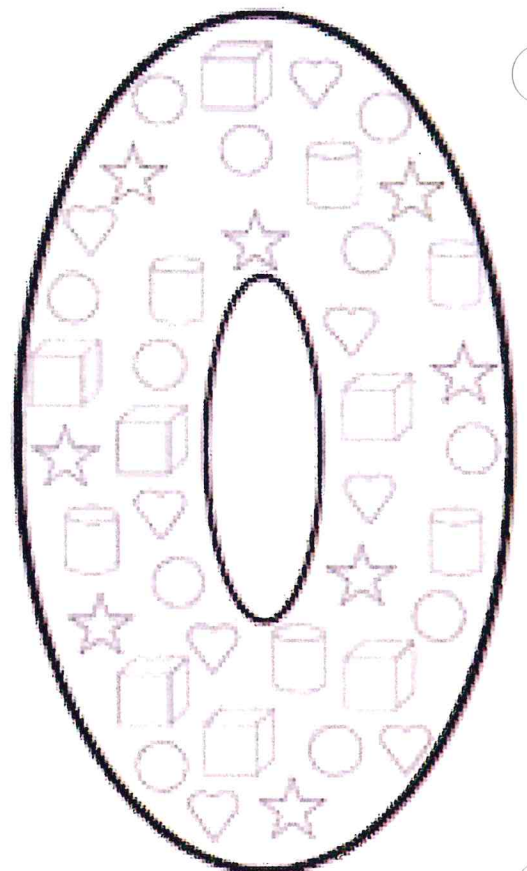
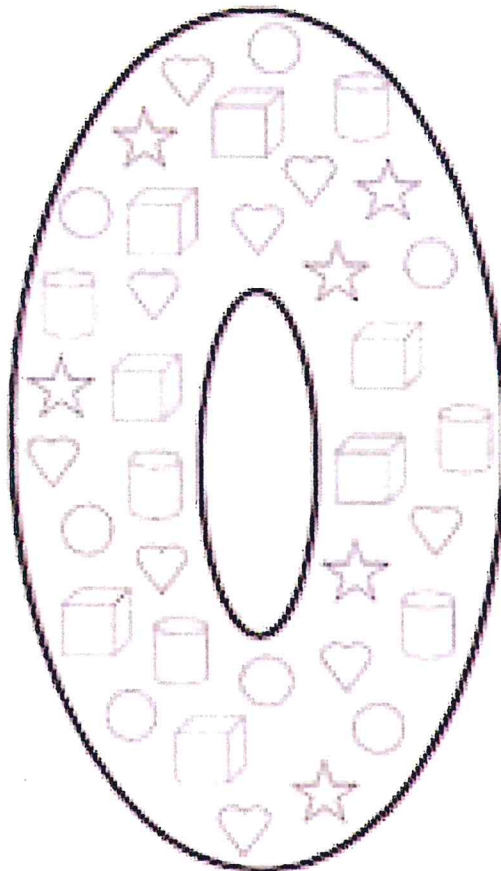
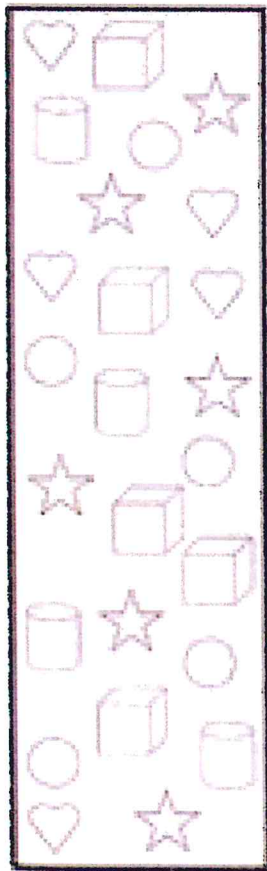
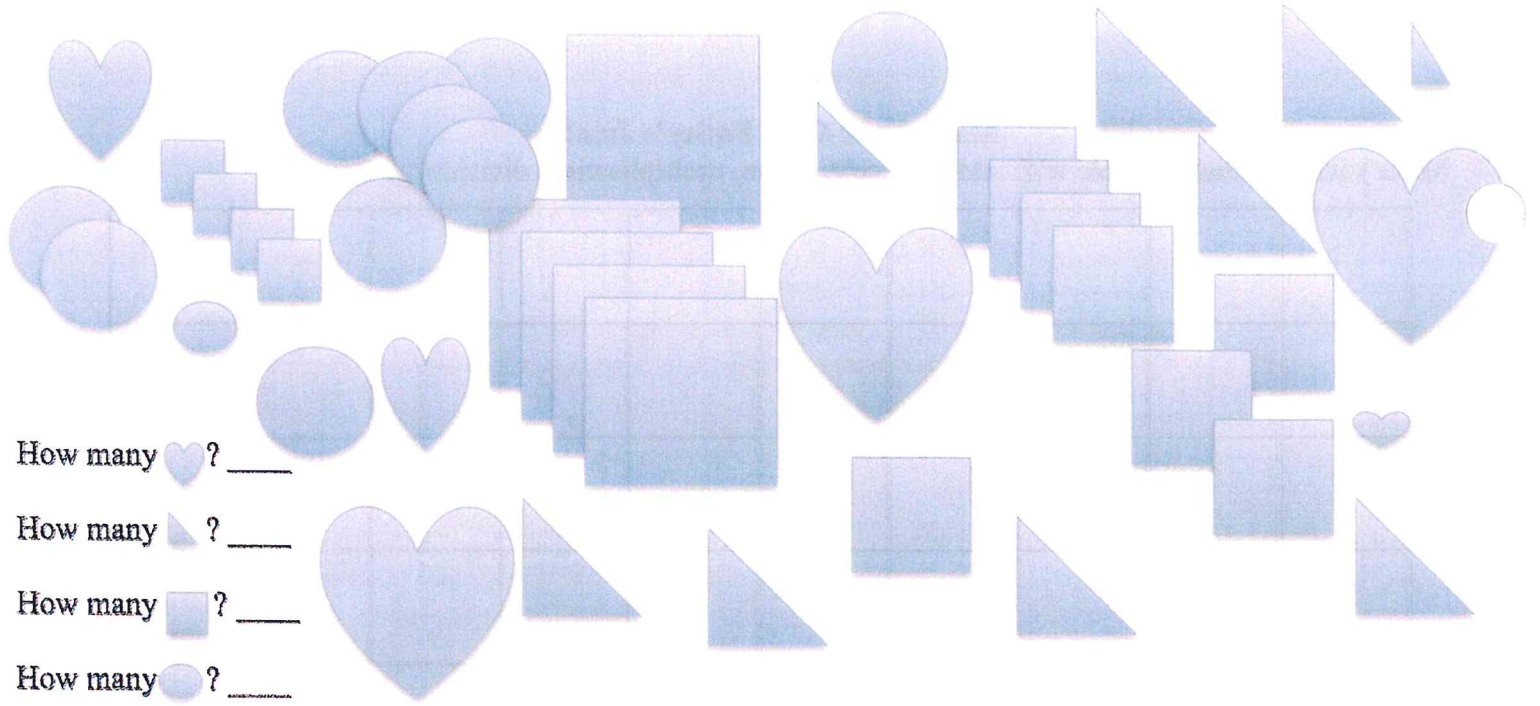
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[illegible]

C

[illegible]



How Many? _____
